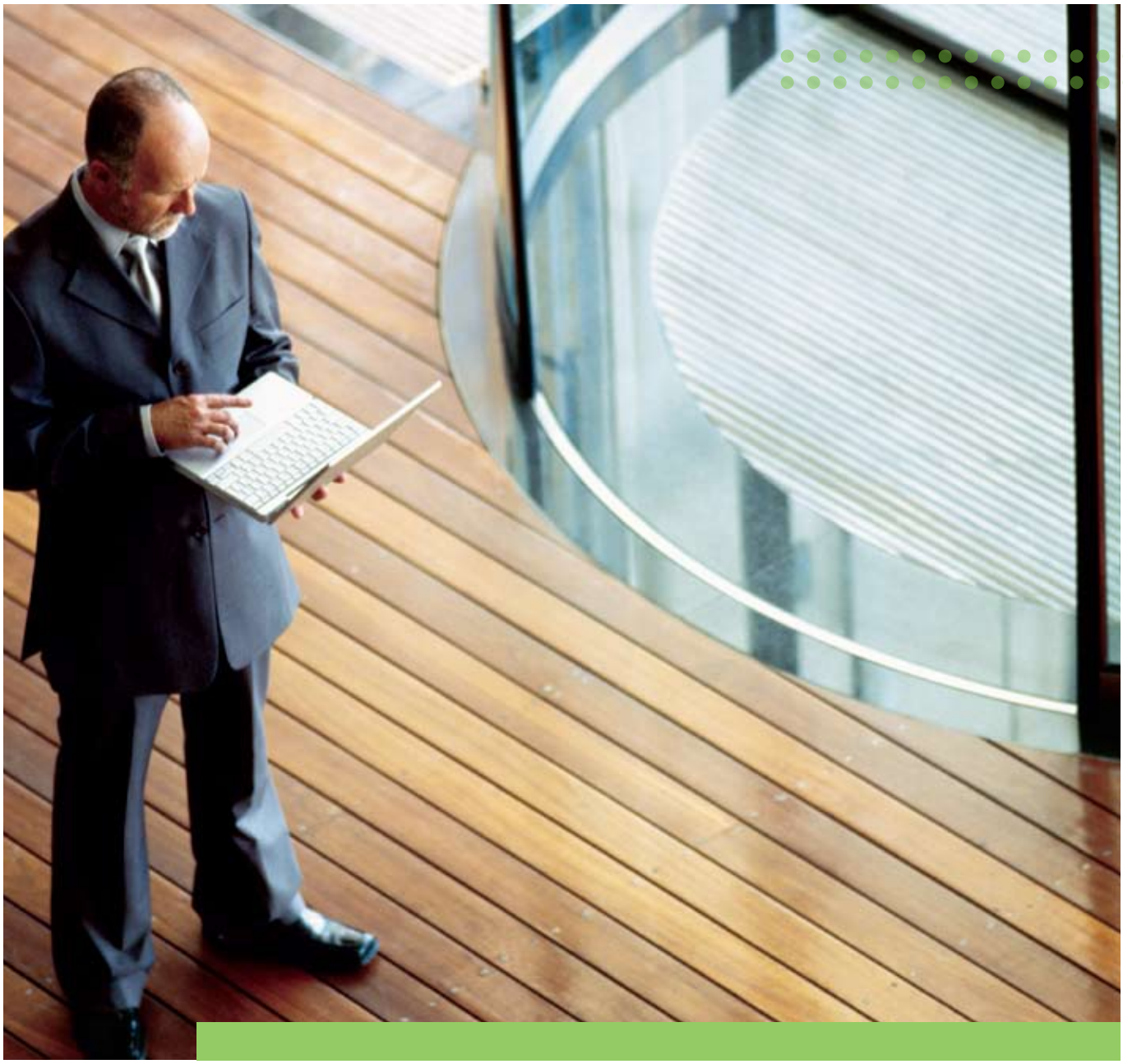
Alcatel-Lucent 1850 TSS-320

Transport Service Switch



The Alcatel-Lucent 1850 Transport Service Switch (TSS)-320, a new class of multiservice transport platform for metro-core and regional applications, supports any mix of traffic, from all-circuit to all-packet. This universal switch uniquely addresses the transition from TDM/circuit to packet transport, eliminating the blocking problems encountered when traditional platforms face data-traffic increases. The functional versatility of the 1850 TSS-320 allows service providers to support current demands on their network, while positioning their infrastructure for the future growth of advanced service delivery and traffic.

Transforming Transport Networks

To stay profitable, service providers must focus on new revenue-generating services while carefully controlling their cost structures. At the same time, new bandwidth-hungry services, such as triple play and Ethernet virtual private networks (VPNs), are redefining the underlying transport-infrastructure requirements. These changes are driving the move from circuit-based transport, using Time Division Multiplexing (TDM), to packet-based transport, using Ethernet in MANs and WANs.

Driven by end-user demand for new services, service-provider network capacity is growing rapidly, with these networks transporting a wide variety of traffic. Service providers all need to assess how their existing metro and core networks will accommodate trends and transitions in traffic patterns.

The new-services introduction is probably the most critical factor to a service provider's success. The increasing demand for bandwidth to deliver new services is not reflected in comparable increases in revenue, presenting a significant business challenge. The Alcatel-Lucent 1850 TSS-320 helps service providers maximize their profitability by transporting any service mix while keeping tight control of costs.

FEATURES	BENEFITS
Single transport-aggregation platform	• Seamlessly transports any type of service, in any mix • Supports future traffic requirements • Simplifies network operation, reducing OPEX
Open architecture	• Integrates Ethernet and TDM switching • Uses SONET/SDH and DWDM • ROADM functionality • Splits increasing traffic demands among any combination of transport technologies
Technology independent	• Universal switch • Switches packets or circuits in native format, avoiding expensive mapping • Increases scalability
Technology-dependent line cards	Native traffic processing, including: • Overhead management • Performance-monitoring protections • Packet classification • Policing • Scheduling

Multitechnology Support with the Alcatel-Lucent 1850 TSS-320

The Alcatel-Lucent 1850 TSS-320 represents the next step toward a converged transport network. It is a single transport-aggregation platform for switching packets and circuits, seamlessly transporting any type of service in any possible mix, allowing service providers to build future-safe transport networks that can support future traffic requirements. The industry's first transport service switch, it uses an open architecture that integrates Ethernet switching, TDM switching, using Synchronous Optical Network/Synchronous Digital Hierarchy (SONET/SDH) and dense wavelength division multiplexing (DWDM), with reconfigurable optical add/drop multiplexer (ROADM) functionality.

This unique capability makes the Alcatel-Lucent 1850 TSS-320 an ideal building block for the ongoing transformation of transport networks, flexibly splitting increasing traffic demands among any combination of carrier-Ethernet switching, DWDM and TDM transport technologies. This allows service providers to overcome scalability and technology issues, regardless of future traffic-pattern changes.

Service providers no longer need to debate which transport technology is the most appropriate to deliver their current or future service mix. The Alcatel-Lucent 1850 TSS-320 offers them all (see Table 1).

Table 1. An Open Platform Supporting Multiple Technologies

APPLICATIONS AND SERVICES	ALCATEL-LUCENT 1850 TSS-320		
	CARRIER ETHERNET	DWDM	TDM
Triple play	X	X	
Business	X	X	X
Mobile	X		X
Carrier-to-carrier	X	X	X

The Universal Switch

The Alcatel-Lucent 1850 TSS-320 offers service providers a powerful tool for running future-safe transport networks, with total freedom in planning network resources to support the delivery of new broadband applications such as triple play, video, mobile and Ethernet business services. It also ensures seamless interworking with the existing transport assets that support existing revenues, while fully addressing the optical-packet transport convergence, as demanded by key American service providers. This universal switch flexibly supports scalable aggregation and transport at the wavelength level, the Wavelength Selective Switch (WSS)-based multidegree ROADM, and also at the subwavelength level for both synchronous, or SONET, and asynchronous, or packet, traffic. The Alcatel-Lucent 1850 TSS-320 offers the following advantages:

- Any mix of Ethernet, TDM, Wave Division Multiplexing (WDM), Optical Transport Network (OTN) and future services with only a simple change of interface cards, eliminating the need for future switch investments as new services or protocols emerge.
- Technology-independent, universal switch, capable of switching packets or circuits in their native format and transporting them as they are, without costly mapping of circuits into packets or packets into circuits. The universal switch provides scalable switching capacity regardless of the traffic type.

- Technology-dependent line cards, packet, circuit or wavelength, where traffic is properly processed according to its native format, including:
  - ¬ Overhead management
  - ¬ Performance-monitoring protections for operations, administration and maintenance (OAM)
  - ¬ Packet classification
  - ¬ Policing
  - ¬ Scheduling

  The line cards provide native traffic processing.
- This innovative demarcation between traffic processing and traffic switching eliminates the cost penalties associated with technology-dependent processing performed in the switch (matrix) found in traditional transport-node architectures. Packet, TDM or WDM traffic processing resides on the relevant line cards. Gradual investment, in step with traffic requirements, is possible.
- The fully ROADM architecture provides the flexibility and scalability needed for today's service-provider operating networks, where traffic is hard to predict, or where traffic churn is important. ROADM offers the advantages of any-to-any node support, remote configuration and reconfiguration, gain equalization, reduced truck rolls and multidegree meshed network architectures.

The concept of a single transport-aggregation platform is a breakthrough in service-provider networking. Instead of investing in several network layers to provide the required service mix, service providers can now choose one platform that delivers all services. By deploying the Alcatel-Lucent 1850 TSS-320 as a unified transport platform supporting any mix of services, service providers can:

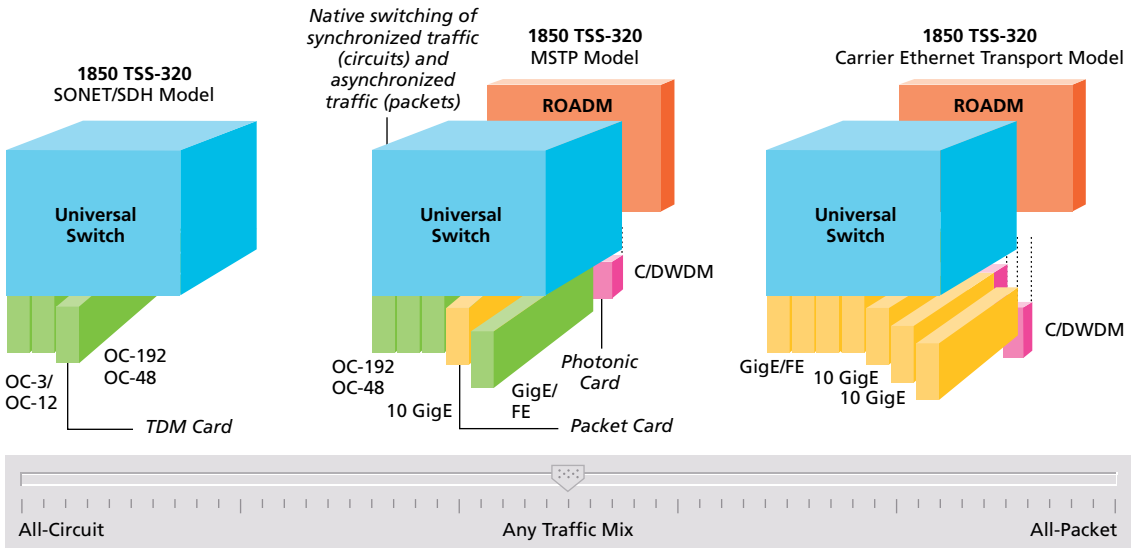
- Simplify network operations, significantly reducing operating expenditures (OPEX) and increasing the network flexibility and scalability
- Lower the risk of capital expenditures (CAPEX) investments that may vary over time, depending on service-demand changes
- Shorten time-to-revenue for new services

Migrating Toward a Packet Transport Network

Leveraging its universal, open architecture, the Alcatel-Lucent 1850 TSS-320 is positioned to help service providers migrate their transport networks from all-circuit to all-packet. It integrates a full set of SONET/SDH features to support traditional transport-network architectures and to interwork with a large, existing installed base of equipment.

In addition, the platform supports transport packet switching, such as packet operations, administration, maintenance and provisioning (OAM&P), and integrated G.709 Optical Transport Hierarchy (OTH) trunk cards. The Alcatel-Lucent 1850 TSS-320 provides a cost-effective solution for implementing resilient metro and aggregation networks. This solution uniquely transitions from TDM/circuit to packet transport by smoothly migrating toward the delivery of advanced packet-based services, maximizing return on investment over the network lifecycle (see Figure 1).

Figure 1. Seamless Network Transformation to All-Packet-Photonic Transport

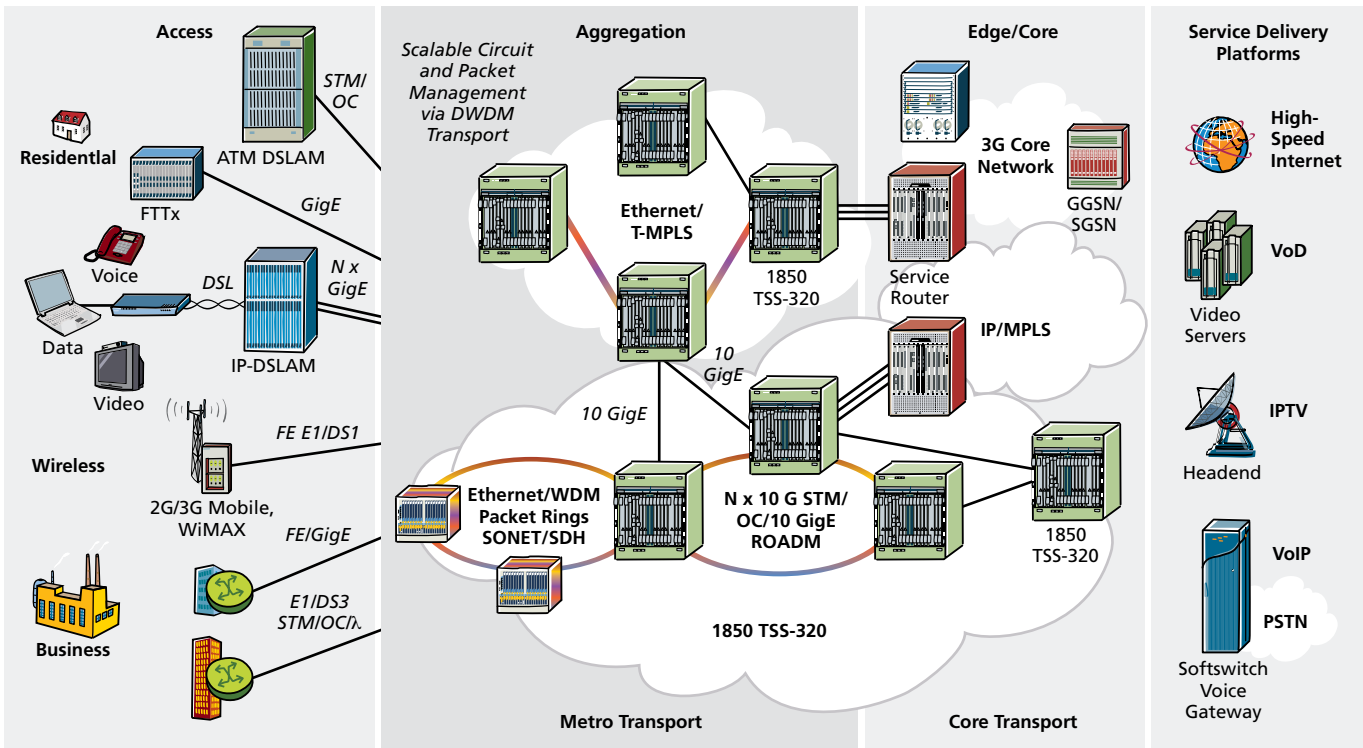


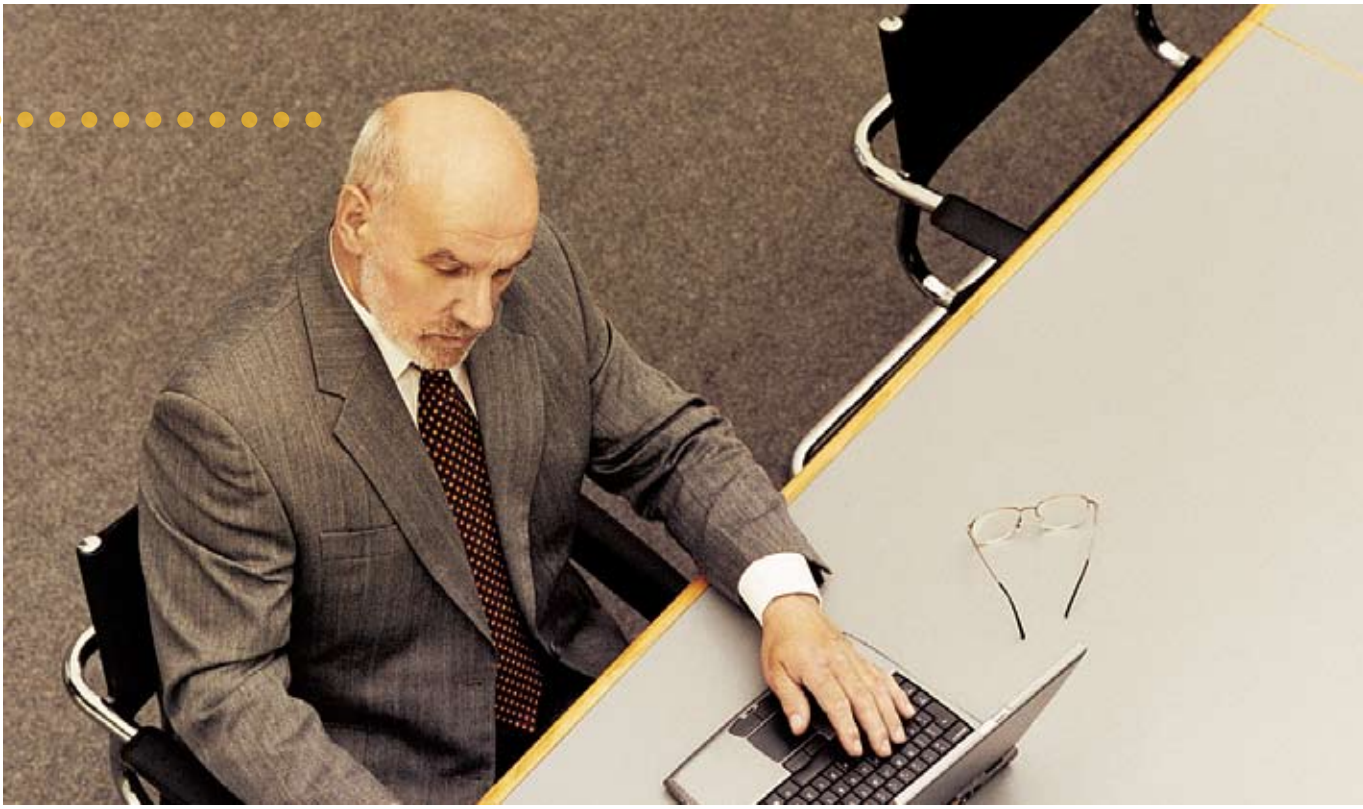
Offering User-Centric Broadband Services

The Alcatel-Lucent 1850 TSS-320 universal-transport platform allows for new large-scale generation services:

- Ethernet business services: Ethernet-line, Ethernet-LAN
- Triple play: Large-scale Ethernet aggregation for Internet Protocol television (IPTV)
- Mobile backhauling: Ethernet and TDM native support for mobile second-generation mobile system/third-generation mobile system/Worldwide Interoperability for Microwave Access (2G/ 3G/WiMAX)
- Carrier-to-carrier services: Packet/TDM/lambda (λ)
- Mission-critical services: Government, research, TV broadcasters, energy utilities and transportation

Figure 2. Broadband Accesses (Residential and Business) Network Architecture





Broadband Aggregation for Triple Play

Introducing triple play services establishes new requirements for the broadband-aggregation infrastructure for both scalability and the speed of service rollout. To meet these goals, many service providers are introducing Ethernet into their broadband-access infrastructures. This type of infrastructure allows network service providers to progressively integrate their triple play services into a unified and homogeneous environment.

The Alcatel-Lucent 1850 TSS-320 can provide efficiently distributed broadband service aggregation and transport toward the broadband service routers. The Alcatel-Lucent 1850 TSS-320 is a unified transport platform, offering flexible support during the transition from legacy transport to Ethernet. The unified aggregation platform supports any multiservice business model and protects infrastructure investments. For distributing video, it is important to broadcast these services from the last possible point in the network to avoid costs from duplicating services inside the network. With a dedicated Ethernet network or a multiservice network, the multicast can be done efficiently at either the TDM or Ethernet level. The Alcatel-Lucent 1850 TSS-320 can use a combination of distributed Layer 2 and TDM switching, depending on the option that suits the provider's requirements and minimizes costs.

Ethernet Business Services

Enterprises are increasing their use of high-bandwidth applications and they are more frequently interconnecting LANs and data centers within a metro area. To address this market, service providers need scalable, carrier-class solutions that offer guaranteed quality of service (QoS) levels, support for differentiated service level agreements (SLAs) and customer separation. Service providers can build either dedicated Ethernet networks or multiservice networks able to provide other services through the same networking platform. The Alcatel-Lucent 1850 TSS-320 supports both of these network models.

Mobile Backhaul

Wireless network traffic is increasing significantly as subscribers use their mobile phones more and new, wireless data services are introduced, such as video telephony, music, Internet surfing and live television, along with video-on-demand (VoD), for example, information, football, movie trailers and clips. Price-based competition makes profitable growth a challenge. Nevertheless, service providers are forced to invest in new infrastructure to serve their customers' needs. Should they expand with TDM technology for more capacity now and worry about strategically evolving to 3G and all-IP later, or can they expand innovatively, making the network better now, but also anticipating future requirements?

The Alcatel-Lucent 1850 TSS-320 addresses both options, providing a fully flexible and reliable transport platform, both Ethernet- and TDM-based, that meets today's growth requirements and opens the door for a strategic move toward an IP-based infrastructure.

Network Management

The Alcatel 1350 Open Media Suite (OMS) management suite eliminates the need to deploy multi-technology element and network management systems, reducing CAPEX and OPEX. It offers a highly modular architecture to properly match service-provider requirements, offering incremental investments that are in step with demand. Service providers need to focus on the service, rather than the technology, where it is used, how the network scales and how complex it is. By migrating from a technology-based network management model to a service-oriented one, the complexity of managing services is greatly reduced.

Masking the complexity of the underlying network is the job of the Alcatel-Lucent 1350 OMS management suite, offering:

- Simplified presentation of a multitechnology network to the user:
  - ¬ Point-and-click service delivery
  - ¬ Essential filtered alarms and fault detection
  - ¬ Simple, service-oriented graphical user interface (GUI)
- Future-safe, scalable platform that can be extended as the network and its services grow from a few units to thousands of network elements
- Unified management access for service providers, independent of location, network layer or technology: Single point-of-alarm collection, all network management information available on a single platform and a single logon procedure

Versatility and Scalability

Support current network demands, while positioning your infrastructure for future growth and advanced service delivery. The Alcatel-Lucent 1850 TSS-320 facilitates the transport of packets and circuits, as well as multiservice aggregation to optimize network efficiency and eliminate inefficient mapping. A powerful cross-layer network management simplifies operations and reduces the total cost of ownership. Allowing flexible provisioning of Ethernet, SONET/ SDH and DWDM/OTN, the 1850 TSS-320 avoids the blocking problems encountered by traditional MSPP/MSTP solutions.

Recognized World Leader in Optical Networking

Alcatel-Lucent delivers end-to-end communications solutions to service providers and enterprises anywhere in the world. Leveraging its network equipment as well as services, Alcatel-Lucent facilitates its customers' service offerings and revenue streams. As the recognized world leader in optical networking, Alcatel-Lucent is in a unique position to help service providers navigate through current market conditions. Alcatel-Lucent, with its global reach and scale, combined with local presence in over 130 countries, makes use of a deep understanding of global market dynamics, as well as the ability to anticipate local requirements.

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